

WHAT IS CLAIMED IS:

1. An optical add/drop multiplexer connected to an optical fiber for transmission of a multiplexed optical signal, comprising:

5 a wavelength division multiplexing/demultiplexing (WDM) unit connected to the optical fiber having input and output ports providing a path for a multiplexed optical signal, and a plurality of demultiplexing ports respectively providing paths for demultiplexed channels; and

a plurality of add/drop multiplexer (ADM) units respectively connected to the demultiplexing ports of the WDM unit, each of the ADM units including first and second
10 circulators adapted to output a channel, input to a higher-order port, to a lower-order port, and a reflector for passing or reflecting a channel input thereto,

wherein the first circulator receives a channel at a second port, outputs the channel to a third port connected to the reflector, receives the channel from the reflector at the third port, and outputs the channel to a fourth port, thereby dropping the channel.

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2. The optical add/drop multiplexer according to claim 1, wherein the WDM unit comprises:

an end circulator having first through third ports and adapted to output an optical signal, input to a higher-order port, to a lower-order port, the first and third ports of the end
20 circulator connected to the optical fiber for transmission of the multiplexed optical signal; and

a wavelength division multiplexer/demultiplexer (WDM) having a multiplexing port connected to the second port of the end circulator and providing a path for a multiplexed optical signal, and a plurality of demultiplexing ports respectively providing

paths for demultiplexed channels.

3. The optical add/drop multiplexer according to claim 2, wherein the WDM comprises an arrayed waveguide grating.

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4. An optical add/drop multiplexer connected to an optical fiber for transmission of a multiplexed optical signal, comprising:

a wavelength division multiplexing/demultiplexing (WDM) unit connected to the optical fiber having input and output ports providing a path for a multiplexed optical signal, and a plurality of demultiplexing ports respectively providing paths for demultiplexed channels; and

a plurality of add/drop multiplexer (ADM) units respectively connected to the demultiplexing ports of the WDM unit, each of the ADM units including first and second circulators adapted to output a channel, input to a higher-order port, to a lower-order port, and a reflector for passing or reflecting a channel input thereto,

wherein the second circulator receives a channel at a first port, outputs the channel to a second port connected to the reflector, receives the channel from the reflector at the second port, and outputs the channel to a third port connected to a first port of the first circulator, thereby adding the channel.

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5. The optical add/drop multiplexer according to claim 4, wherein the WDM unit comprises:

an end circulator having first through third ports and adapted to output an optical signal, input to a higher-order port, to a lower-order port, the first and third ports of the end

circulator connected to the optical fiber for transmission of the multiplexed optical signal;
and

a wavelength division multiplexer/demultiplexer (WDM) having a multiplexing
port connected to the second port of the end circulator and providing a path for a
5 multiplexed optical signal, and a plurality of demultiplexing ports respectively providing
paths for demultiplexed channels.

6. The optical add/drop multiplexer according to claim 5, wherein the WDM
comprises an arrayed waveguide grating.

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7. An optical add/drop multiplexer connected to an optical fiber for transmission of
a multiplexed optical signal, comprising:

a wavelength division multiplexing/demultiplexing (WDM) unit connected to the
optical fiber having input and output ports providing a path for a multiplexed optical signal,
15 and a plurality of demultiplexing ports respectively providing paths for demultiplexed
channels; and

a plurality of add/drop multiplexer (ADM) units respectively connected to the
demultiplexing ports of the WDM unit, each of the ADM units including first and second
circulators adapted to output a channel, input to a higher-order port, to a lower-order port,
20 and a reflector for passing or reflecting a channel input thereto,

wherein a channel passing through the ADM unit sequentially passes through the
second and third ports of the first circulator, the reflector, the second and third ports of the
second circulator, and the first and second ports of the first circulator.

8. The optical add/drop multiplexer according to claim 7, wherein the WDM unit comprises:

an end circulator having first through third ports and adapted to output an optical signal, input to a higher-order port, to a lower-order port, the first and third ports of the end circulator connected to the optical fiber for transmission of the multiplexed optical signal;
5 and

a wavelength division multiplexer/demultiplexer (WDM) having a multiplexing port connected to the second port of the end circulator and providing a path for a multiplexed optical signal, and a plurality of demultiplexing ports respectively providing
10 paths for demultiplexed channels.

9. The optical add/drop multiplexer according to claim 8, wherein the WDM comprises an arrayed waveguide grating.

15 10. An optical add/drop multiplexer connected to an optical fiber for transmission of a multiplexed optical signal, comprising:

a wavelength division multiplexing/demultiplexing (WDM) unit connected to the optical fiber having input and output ports providing a path for a multiplexed optical signal, and a plurality of demultiplexing ports respectively providing paths for demultiplexed
20 channels; and

a plurality of add/drop multiplexer (ADM) units respectively connected to the demultiplexing ports of the WDM unit, each of the ADM units including a circulator adapted to output a channel, input to a higher-order port, to a lower-order port, and a reflector connected between two ports of the circulator, and adapted to pass or reflect a

channel input thereto,

wherein the circulator receives a channel at a second port, outputs the channel to a third port connected to the reflector, receives the channel from the reflector at the third port, and outputs the channel to a fourth port thereof, thereby dropping the channel,.

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11. The optical add/drop multiplexer according to claim 10, wherein the WDM unit comprises:

an end circulator having first through third ports and adapted to output an optical signal, input to a higher-order port, to a lower-order port, the first and third ports of the
10 circulator connected to the optical fiber for transmission of the multiplexed optical signal;
and

a wavelength division multiplexer/demultiplexer (WDM) having a multiplexing port connected to the second port of the end circulator and providing a path for a multiplexed optical signal, and a plurality of demultiplexing ports respectively providing
15 paths for demultiplexed channels.

12. The optical add/drop multiplexer according to claim 11, wherein the WDM comprises an arrayed waveguide grating.

20 13. An optical add/drop multiplexer connected to an optical fiber for transmission of a multiplexed optical signal, comprising:

a wavelength division multiplexing/demultiplexing (WDM) unit connected to the optical fiber having input and output ports providing a path for a multiplexed optical signal, and a plurality of demultiplexing ports respectively providing paths for demultiplexed

channels; and

a plurality of add/drop multiplexer (ADM) units respectively connected to the demultiplexing ports of the WDM unit, each of the ADM units including a circulator adapted to output a channel, input to a higher-order port, to a lower-order port, and a
5 reflector connected between two ports of the circulator, and adapted to pass or reflect a channel input thereto,

wherein the circulator also receives a channel at a fifth port, outputs the channel to a first port connected to the reflector, and receives the channel from the reflector at the first port, thereby adding the channel.

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14. The optical add/drop multiplexer according to claim 13, wherein the WDM unit comprises:

an end circulator having first through third ports and adapted to output an optical signal, input to a higher-order port, to a lower-order port, the first and third ports of the end
15 circulator connected to the optical fiber for transmission of the multiplexed optical signal; and

a wavelength division multiplexer/demultiplexer (WDM) having a multiplexing port connected to the second port of the end circulator and providing a path for a multiplexed optical signal, and a plurality of demultiplexing ports respectively providing
20 paths for demultiplexed channels.

15. The optical add/drop multiplexer according to claim 14, wherein the WDM comprises an arrayed waveguide grating.

16. An optical add/drop multiplexer connected to an optical fiber for transmission of a multiplexed optical signal, comprising:

a wavelength division multiplexing/demultiplexing (WDM) unit connected to the optical fiber having input and output ports providing a path for a multiplexed optical signal,
5 and a plurality of demultiplexing ports respectively providing paths for demultiplexed channels; and

a plurality of add/drop multiplexer (ADM) units respectively connected to the demultiplexing ports of the WDM unit, each of the ADM units including a circulator adapted to output a channel, input to a higher-order port, to a lower-order port, and a
10 reflector connected between two ports of the circulator, and adapted to pass or reflect a channel input thereto,

wherein a channel passing through the ADM unit sequentially passes through the second and third ports of the circulator, the reflector, and the first and second ports of the circulator.

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17. The optical add/drop multiplexer according to claim 16, wherein the WDM unit comprises:

an end circulator having first through third ports and adapted to output an optical signal, input to a higher-order port, to a lower-order port, the first and third ports of the end
20 circulator connected to the optical fiber for transmission of the multiplexed optical signal; and

a wavelength division multiplexer/demultiplexer (WDM) having a multiplexing port connected to the second port of the end circulator and providing a path for a multiplexed optical signal, and a plurality of demultiplexing ports respectively providing

paths for demultiplexed channels.

18. The optical add/drop multiplexer according to claim 17, wherein the WDM comprises an arrayed waveguide grating.